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Application No.: 10/646,094

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AMENDMENTS TO THE DRAWINGS

Please add FIG. 1A provided on the attached New Sheet.

REMARKS**1) Objections to the Drawings****a) Die Block Halves**

The drawings were objected to under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the drawings were objected to for failing to show the “moveable die block half” and the “stationary die block half.” FIG. 1A has been added to include stationary die block half E. As originally presented, “[d]ie block D in Figures 1 and 2 is a movable-die half and includes mounting slot M and core C.” (Original Specification at Page 5, lines 20 – 21.) The new FIG. 1A presented in the Replacement Sheet includes stationary die block half E. Stationary die block E is properly described in the specification and, as such, no new matter is being added to with the addition of FIG. 1A. For example, as originally presented, the specification states that “[f]igures 1 and 2 also incorporate a fixed-die half (not shown), to which die block D is clamped, enclosing core C to create the complete molding or casting core.” (Original Specification at Page 5, lines 24 – 26.) Also, “head 44 of cam lever 28 is directly attached to a fixed die half of the apparatus (not shown).” (Original Specification at Page 9, lines 6 – 7.) The Specification has been amended to identify the stationary die block with the reference character “E.” Thus, FIG. 1A has been added without adding new matter to show the “stationary die block half” and the objection to the drawings for failing to show the die block halves is overcome.

b) Oblique Angle

The drawings were objected to under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the drawings were objected to for failing to show a slide comprising “a slot having a first flat surface and extending centrally through the slide at an angle oblique to the rails.” An oblique angle comprises an angle “having a slanting or sloping direction.” (See American Heritage Dictionary, Second College Edition, 1985.) Likewise, oblique lines are “neither parallel nor perpendicular.” (Id.) The Office Action admits that “the first flat surface is at an angle oblique to the rails.” (Office Action, Paragraph 1.) The Office Action further

admits that slot 70 extends into slide 26 at an acute angle, as referenced to the surface parallel to the rails. (Id.) An acute angle is neither a parallel or perpendicular angle. Thus, by the Office Action's own admission, slot 70 extends at an angle oblique to the rails. Claim 1 has been amended to clarify that the slot extends through the slide at an angle oblique to the surface subsuming the rails. Thus, the figures taken collectively, show slot 70 extending through slide 26 at an oblique angle to the surface including the rails. The objection to the drawings for failing to show that slot 70 extends at an oblique angle into slide 26 is overcome.

c) First and Second Flat Surfaces

The drawings were objected to under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the drawings were objected to for failing to show "a slot having a first and second flat surface" and "a tail having a first and second flat surface."

The Office Action states that these features must be cancelled from the claims or shown in the drawings. Claims 1 and 4 have been amended to eliminate reference to the slot and the tail having second flat surfaces. Claims 1 and 4 have also been amended such that the first flat surface of the slot is recited as a "first slide flat surface" and the second flat surface of the tail is recited as a "first cam flat surface" for further clarity. Claims 9 and 28, however, have been amended to include a cam lever having first and second flat faces and a slide having first and second flat surfaces.

The figures collectively show that the slide and the cam lever have two flat surfaces each. First, with respect to cam lever 28, FIG. 10d shows a front view of cam lever 28 in which a first flat surface can be seen. Additionally, FIG. 6 shows a perspective view of cam lever 28 in which the first flat surface can be seen. In FIG 10d and FIG. 6, the lead line for reference character 46, the tail, is drawn to the first cam flat surface. Also, FIG. 10b shows a top view of cam lever 28 in which a second flat surface can be seen. Likewise, FIG. 4 shows a cross-section through cam lever 28 in which the first and second flat surfaces can be seen as being parallel to each other.

With respect to slide 26, FIG. 9c shows a bottom view of slide 26 in which a first slide flat surface in phantom lines is shown extending toward slot 70. FIG. 6 shows a perspective

view of slide 26 in which a second flat surface can be seen in slot 70. FIG. 9b shows a cross-sectional view extending through slide 26. The cross-section extends perpendicular to the first and second flat surfaces of the slide. As can be further seen in FIG. 4, which shows the same cross-section with cam lever 28, the first cam flat face of cam lever 28 abuts the first flat surface of the slide, and the second flat face of cam lever 28 abuts a second flat surface of the slide.

Thus, the figures, when viewed collectively, illustrate that cam lever 28 and slide 26 each have first and second flat surfaces or faces. The objection to the drawings for failing to show first and second cam flat surface and first and second slide flat surface is overcome.

2) Objections to the Specification

a) Numbering Informalities

The disclosure was objected to because the Specification includes a plurality of informalities regarding numbering of the figures. With the above amendments to the Specification, the informalities enumerated in the Office Action, as well as other informalities detected after reviewing the Specification, have been corrected. The Specification was also amended to reflect the incorporation of stationary die block half E added to FIG. 1. Thus, the objection to the disclosure is overcome.

b) Antecedent Basis

In referencing M.P.E.P. § 608.01(o), the Office Action states that Claims 4 and 20 are objected for failing to provide proper antecedent basis for the claimed subject matter. Specifically, the Office Action states that proper antecedent basis for the limitation “wherein the angle between the head and the tail is greater than 130 degrees and less than 160 degrees” is not found. M.P.E.P. § 608.01(o) states, however, that “the meaning of every term used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import;...” M.P.E.P. § 608.01(o) goes on to state that a “term may be given special meaning in the description,” but that “[n]o term may be given a meaning repugnant to the usual meaning of the term.” Thus,

M.P.E.P. § 608.01(o) is directed at words given improper meanings in the claims that are not supported in the Specification. Claims 4 and 20, however, include no words having special meanings. Specifically, the words “wherein the angle between the head and the tail is greater than 130 degrees and less than 160 degrees” are accorded their plain meaning. The specification states that “head 44 is positioned at an angle to tail 46.” (Application at Page 13, line 23.) Claims 4 and 20 further specify the angle at which tail 46 extends from head 44. “It is now well accepted that a satisfactory description may be in the claims or any other portion of the originally filed specification.” M.P.E.P. § 2163. Additionally, Claims 1 and 4 have been amended to clarify that the angle specified is referenced from the front surface of the head to further define the claimed limitations. As can be seen in the figures of the Application, a positive angle measured counter-clockwise from the vertical, front surface of head 44, as defined by FIGS. 10c and 10d, measures approximately 155 degrees. Thus, the rejection to Claims 4 and 20 under M.P.E.P. § 608.01(o) is overcome and should be withdrawn.

3) Claim Objections

The Office Action rejected Claim 4 because it depends from canceled Claim 2. Claim 4 has been amended to depend from Claim 1.

4) Claim Rejections

a) 35 U.S.C. 112, First Paragraph

The Office Action states that Claim 24 is rejected under Section 112, first paragraph as failing to comply with the written description requirement. Specifically, the Office Action asserts that the specification does not disclose an oblique angle between the head and the flat face of the tail as being approximately 155 degrees, and states that this was not part of the original disclosure. FIG. 10c, which was part of the originally filed application, however, clearly shows tail 46 extending from head 44 at an angle of 155 degrees. As described above, a positive angle measured counter-clockwise from the vertical, front surface of head 44, as defined by FIGS. 10c and 10d, measures

approximately 155 degrees. “An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitation using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention.” (M.P.E.P. § 2163.) Newly added claim limitations can be supported in the specification through implicit or inherent disclosure. (See M.P.E.P § 2163.) FIG. 10c thus provides description in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention. Thus, the rejection to Claim 24 is overcome and should be withdrawn.

b) 35 U.S.C. 102

i) Navarre

The Office Action rejected Claims 1 and 7 under 35 U.S.C. 102(b) as being anticipated by Navarre, U.S. Pat. No. 6,093,015. Specifically, the Office Actions states that Navarre discloses a slide assembly comprising a slide (40) having a first flat surface (46) extending through the slide at an angle oblique to the rails, and cam lever (64) having a second flat surface (22).

The Office Action, however, fails to address a key element of the claim. In order to anticipate a claim, a reference must teach each and every element of the claim. (See M.P.E.P. § 2131.) Amended Claim 1 requires that the flat surface of the slide flushly abut the flat surface of the cam lever to retain position of the slide during the molding or casting cycle. As described in the Specification of the present Application, “cam lever 28 securely locks slide 26 with base 24, preventing slide 26 from retracting away from core C during a molding or casting cycle.” (Application at Page 6, lines 14 – 16.) As can be seen in FIGS. 3 and 4 of the present Application, the flat, front face of cam lever 28 abuts the flat, front face of slot 70 of slide 26 to achieve this result. As seen in the figures of Navarre, flat surface 46 of slide 40 and flat surface 22 of cam lever 64 only contact when the cam 12 is being removed from slide 40, after the injection phase of the molding or casting process. Specifically, FIG. 9 shows surface 22 and surface 46 in contact, “during the course of a mold opening sequence.” (Navarre at Col. 5, lines 24 – 27.) Thus, flat surface 22 of

cam lever 64 does not retain position of slide 40 during an injection phase of a molding or casting cycle.

Furthermore, no surface of cam holder extension 24 of cam lever 64 of Navarre contacts slide 40 while molding material is injected into the mold cavity. Core locking cam surface 74, however, “acts to hold securely the core slide 40 in position so that the mold cavity is in condition to receive molding material....” (Navarre at Col. 5, lines 13 – 16.) Core locking cam surface 74 is positioned on cam member 64, not cam extension 24. As shown in the figures of Navarre, locking cam surface 74 is curved, not flat. Conversely, in the presently claimed invention, cam lever 28, which extends from head 44, includes a flat surface that flushly abuts slide 26. Thus, cam lever 64 does not include a flat surface on cam extension 24 that is used to hold slide 40 in place during an injection phase of a molding or casting cycle.

Additionally, Claim 1 has been amended to include a coupler positioned opposite a faceplate for connection to a hydraulic actuation mechanism. Navarre fails to disclose a hydraulic coupler.

Thus, the rejection of Claim 1 based on Navarre is overcome and the rejection should be withdrawn. Claim 7, which depends from Claim 1, is therefore also in condition for allowance.

ii) Horbach

The Office Action rejected Claims 1, 16 and 21 under 35 U.S.C. 102(b) as being anticipated by Horbach, U.S. Pat. No. 3,932,085. Specifically, the Office Actions states that Horbach discloses slot (32a) extending through slide (14, 16, 32), and cam lever (36) having a tail with a flat surface. However, Horbach fails to teach every element of the claimed invention. As with Navarre, Horbach fails to disclose that the obliquely angled flat surface of cam lever (36) mates with the obliquely angled flat surface of slide (14, 16, 32) during an injection process of the casting or molding cycle. As can be seen in FIG. 2 of Horbach, cam lever (36) abuts slide (14, 16, 32) along a surface perpendicular to the axis on which slide (14, 16, 32) translates. Thus, the angled surface of

cam lever (36) and the angled surface of slide (14, 16, 32) do not abut to retain the position of slide (14, 16, 32) during the injection process.

Additionally, with the present amendments, Claim 1 requires that a faceplate with a core pattern be attached to the slide such that the core pin is retracted into the core. Cam lever 28 forces slide 26 to move along base 24 such that faceplate 32, and core pin 30, are positioned at the molding core. (See Application at Page 9, lines 15 – 17, and Page 6, lines 14 – 17.) As can be seen in FIGS. 2, 9 and 10 of Horbach, slide (14, 16, 32) retracts from around core 20, thus essentially moving the molding cavity rather than moving the core pin. Thus, the rejection of Claim 1 based on Horbach is overcome and the rejection should be withdrawn. Claim 1 has also been amended to include a hydraulic coupler positioned opposite the faceplate, which Horbach does not disclose.

Likewise, with respect to Claim 16, Horbach fails to disclose every element of the present invention. Claim 16 includes a slide having a faceplate including a core pattern such that the core pin is inserted and removed from the casting or molding cavity or core. As mentioned above with respect to Claim 1, FIGS. 2, 9 and 10 of Horbach show slide (14, 16, 32) retracting from around core 20, thus essentially moving the molding cavity rather than moving the core pin. Furthermore, Claim 16 has been amended to further specify the placement of the first and second circuits. Horbach fails to disclose first and second circuits positioned within tracks of the base. Thus, the rejection of Claim 16 based on Horbach is overcome and the rejection should be withdrawn. Claim 21, which depends from Claim 16, is therefore also in condition for allowance.

c) 35 U.S.C. 103

i) Claim 5

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Navarre in view of U.S. Patent No. 6,116,891 to Starkey. Claim 5 has been amended to depend from Claim 27, which depends from independent Claim 1, which as shown above, is in condition for allowance. Thus, Claim 5 is also in condition for allowance. Furthermore, the Office Action states that Starkey discloses first and second circuits to provide signals for limiting movement of the slide. Claims 5

and 27 specify that the location of circuits as being positioned within bores in the base, and that the slide includes a magnet for interacting with the circuit. Starkey shows carrier sensor 126 positioned on switch housing 132 of housing 22 and not within tracks of housing 22 or carrier 18. Thus, Starkey fails to disclose every element of Claim 5.

ii) Claim 8

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Navarre in view of U.S. Patent No. 5,701,947 to Bishenden. Claim 8 has been canceled and the rejection is thereby overcome.

iii) Claims 4, 9, 14, 16, 18, 20 – 23, 25 & 26

Claims 4, 9, 14, 16, 18, 20 – 23, 25 & 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Navarre in view of U.S. Patent No. 4,889,480 to Nakamura et al. and U.S. Patent No. 4,515,342 to Boskovic.

(1) Claim 9

The combination of Navarre, Nakamura and Boskovic fails to teach every element of the present invention as presented in currently amended independent Claim 9. Specifically, Claim 9 requires that the slide have first and second flat slide surfaces that engage with first and second flat faces of the cam lever. As described in the Specification of the present Application, “cam lever 28 securely locks slide 26 with base 24, preventing slide 26 from retracting away from core C during a molding or casting cycle.” (Application at Page 6, lines 14 – 16.) As can be seen in FIGS. 3 and 4 of the present Application, the flat, front face of cam lever 28 abuts the flat, front face of slot 70 of slide 26 to achieve this result. Likewise, [a]s cam lever 28 raises, the angle of tail 46 mechanically forces slide 26 to retract along base 24.” (Application at Page 9, lines 10 – 11.) Furthermore, first slide flat surface and second slide flat surface are parallel to each other, and first flat face and second flat face a parallel to each other.

In Navarre, no surface of cam holder extension 24 of cam lever 64 contacts slide 40 while molding material is injected into the mold cavity. Core locking cam surface 74, however, “acts to hold securely the core slide 40 in position so that the mold cavity is in condition to receive molding material....” (Navarre at Col. 5, lines 13 – 16.) Core locking cam surface 74 is positioned on cam member 64, not cam extension 24. As shown in the figures of Navarre, locking cam surface 74 is curved, not flat. Thus, Navarre does not show a slide having first and second flat slide surfaces that engage with first and second flat faces of a cam lever to insert and remove a core pin from a die or mold core. Furthermore, Navarre does not show a slide having parallel flat surfaces that extend through the slide to receive parallel flat surfaces of a cam lever.

Nakamura also does not disclose a slide having parallel flat surfaces that form a slot to receive parallel flat surfaces of a cam lever to cooperatively work to insert and retract a core pin from a core. Nakamura discloses block body 36, which includes inclined surface 45 for pushing slider block 42 at inclined surface 44 to insert core pattern 34 into cavity mold 31. However, Nakamura does not disclose flat, inclined surfaces of block body 36 that engage slider block 42 to disengage core pattern 34 from cavity mold 31.

Likewise, Boskovic does not disclose a slide having parallel flat surfaces that form a slot to receive parallel flat surfaces of a cam lever to cooperatively work to insert and retract a core pin from a core. Boskovic discloses a circular cam pin 24 that is inserted into bore 28 to move slide 16 to insert and retract core element 18 into the mold cavity.

Claim 9 has been further amended to include other limitations not shown in the cited references. For example, Claim 9 has been amended to include lead bores positioned in an inward facing tracks of the base, and a magnet bore positioned in an outward facing rail of the slide. The Office Actions indicates that U.S. Patent No. 6,116,891 to Starkey discloses first circuit and second circuits for limiting movement of the slide relative to the base. However, Starkey does not disclose placing lead bores for leads of a proximity switch system in the inward facing tracks of the base. Furthermore, Starkey does not disclose putting a magnet bore in the outward facing rail of the slide for movement between the lead bores of the base.

Additionally, Claim 9 has been amended to include a coupler for connection to a hydraulic actuation system wherein the coupler is positioned opposite the face plate. The Office Action states that U.S. Pat. No. 5,701,947 to Bisheden discloses a hydraulic coupling (53) connected to the slide (32) for the purpose of moving the slide and core insert towards and away from the mold cavity. Bisheden does not, however, disclose placing the hydraulic coupler opposite a face plate. Furthermore, Bisheden does not disclose a slide that translates along a base on interlocking tracks and rails. Nor does Bisheden disclose a cam bore extending through the slide between the rails for the purposes of receiving a cam pin. Thus, it would not be obvious to combine the hydraulic coupling (53) of Bisheden with Navarre, Nakamura and Boskovic to teach the placement of the presently claimed coupler.

The combination of Navarre, Nakamura and Boskovic fails to teach every element of the present invention as presented in currently amended independent Claim 9.

(2) Claim 16

The combination of Navarre, Nakamura and Boskovic fails to teach every element of the present invention as presented in currently amended independent Claim 16. Claim 16, including the present amendments, requires first and second tracks and rails that entrain the slide within the base, and a circuit connected to the tracks to limit movement of the slide within the base. The Office Action states that Nakamura discloses base 1 having tracks 7 and slide 42 having rails shown in FIG. 3. The rails shown in FIG. 3, however, do not bound tracks 7 such that slide 42 is entrained within base 1. Regarding the present invention, tracks 60 are grooves within base 24 upon which slide 26 is inserted and move along such that slide 26 is completely entrained and mobile from within base 24. (App. Page 9, lines 24 – 26.) As such, Claim 16 has been amended to specify that the tracks of the base entrain the rails of the slide. Additionally, Claim 16 has been amended to further clarify the position of the circuit. Claim 16 requires that the circuit that limits the movement of the slide within the base be connected to the track of the base. Neither Navarre, Nakamura nor Boskovic disclose the placement of a circuit on tracks of the base to limit movement of the slide. Additionally, Starkey

fails to disclose placing a circuit within rails of the base. Thus, with the above amendments, Claim 16 includes limitations not disclosed in any of the cited references and is in condition for allowance.

(3) Claims 4, 14, 18, 20 – 23, 25 & 26

Claims 4, 14, 18, 20 – 23, 25 and 26 depend from independent Claims 1, 9 or 16, which as shown above, are in condition for allowance. Thus, Claims 4, 14, 18, 20 – 23, 25 and 26 are also in condition for allowance.

iv) Claims 1, 7, 9, 14, 16, 18, 22, 23 & 26

Claims 1, 7, 9, 14, 16, 18, 22, 23 & 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boskovic in view of Horbach. With the present amendments, independent Claims 1, 9 and 16 include limitations not disclosed in the cited references. For example, Claims 9 and 16 have been amended to specify placement of bores and circuits for placing limit switches. Boskovic and Horbach fail to disclose circuitry for limiting the movement of the slide within the base. Also, Starkey, as discussed above, fails to disclose placement of circuits or bores in tracks of the base. Claim 16 further specifies that the tracks of the base entrain the rails of the slide. Claim 1 requires that the slide include a coupler for connecting with a hydraulic actuation system. Neither Boskovic nor Horbach disclose a hydraulic coupler. Furthermore, Claim 1 requires that the coupler be positioned opposite the faceplate. Boskovic teaches away from including a coupler positioned opposite the faceplate. As seen in FIGS. 1 and 2 of Boskovic, slide 16 abuts a heel or shim on the moveable die half when the die is closed. As such slide 16 cannot include a hydraulic coupling on the face of the slide opposite the faceplate. As such independent Claims 1, 9 and 16 are allowable over the cited references. Thus, dependent Claims 7, 14, 18, 22, 23 & 26 are also in condition for allowance.

v) Claims 12 and 17

Claims 12 & 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boskovic in view of Horbach in further view of Bishenden. Claims 12 has been canceled and claim 17 depends from independent Claim 9, which as shown above, is in condition for allowance. Thus, Claim 17 is also in condition for allowance.

vi) Claim 13

Claims 12 & 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boskovic in view of Horbach in further view of Starkey. Claim 13 depends from independent Claim 9, which as shown above, is in condition for allowance. Furthermore, Claim 13 has been amended to include limitations regarding the placement of the first and second circuit that is not shown in Starkey. Specifically, Claim 13 has been amended to specify that the first and second circuits are positioned in lead bores in tracks of the base. As described above, Starkey fails to disclose these limitations. Thus, Claim 13 is also in condition for allowance.

CONCLUSION

With the present amendments, all of the objections and rejections of the application and claims of the present application are overcome. Thus all pending Claims, including new Claims 27 and 28 are in condition for allowance. A Notice to that effect is respectfully requested.

Respectfully submitted,

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6/7/07

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